Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matters of	)	
	)	
Deployment of Wireline Services Offering	)	CC Docket No. 98-147
Advanced Telecommunications Capability	)	
	)	

FIRST REPORT AND ORDER AND FURTHER NOTICE OF PROPOSED RULEMAKING

Adopted: March 18, 1999 **Released: March 31, 1999**

Comment Date: **June 15, 1999**
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By the Commission: Commissioner Furchtgott-Roth dissenting in part and issuing a statement; Commissioner Powell concurring in part and issuing a statement; Commissioner Tristani issuing a separate statement.

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I. INTRODUCTION

1. One of the fundamental goals of the Telecommunications Act of 1996 (1996 Act)[1] is to promote innovation and investment by all participants in the telecommunications marketplace, in order to stimulate competition for all services, including advanced services.[2]

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[1] Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56, *codified at* 47 U.S.C. §§ 151 *et seq.* Hereinafter, all citations to the 1996 Act will be to the 1996 Act as it is codified in the United States Code. The 1996 Act amended the Communications Act of 1934. We will refer to the Communications Act of 1934, as amended, as the "Communications Act" or as the "Act."

[2] Joint Statement of Managers, S. Conf. Rep. No. 104-230, 104th Cong. 2d Sess. 1 (1996) (*Joint Explanatory Statement*). *See also* Letter from Larry Irving, Assistant Secretary for Communications and Information, United States Department of Commerce, to William Kennard, Chairman, Federal Communications Commission, CC Docket No. 98-147, at 2 (filed Jan. 11, 1999) (NTIA January 11, 1999 *Ex Parte*) (stating that the 1996 Act embodies the belief that competition is the engine of infrastructure investment in the deployment of advanced services.) For purposes of this order, we use the term "advanced services" to mean high speed, switched, broadband, wireline telecommunications capability that enables users to originate and receive high-quality voice, data, graphics or video telecommunications using any technology. The term "broadband" is generally used to convey sufficient capacity -- or "bandwidth" -- to transport large amounts of information. As technology evolves, the concept of "broadband" will evolve with it: we may consider today's "broadband" services to be "narrowband" services when tomorrow's technologies appear. Today's broadband services include services based on digital subscriber line technology (commonly referred to as xDSL), including ADSL (asymmetric digital subscriber line), HDSL (high-speed digital subscriber line), UDSL (universal digital subscriber line), VDSL (very-high speed digital subscriber line), and RADSL (rate-adaptive digital subscriber

In this order, we take important steps towards implementing Congress' goals with respect to advanced services.[3]

2. The market for advanced telecommunications is a nascent one. Today, both incumbent local exchange carriers (LECs) and new entrants are at the early stages of developing and deploying innovative new technologies to meet the ever-increasing demand for high-speed, high-capacity advanced services. Because it is in the early stages of development, the advanced services market is ripe for competition to develop in a robust fashion. In order to encourage competition among carriers to develop and deploy new advanced services, it is critical that the marketplace for these services be conducive to investment, innovation, and meeting the needs of consumers.

3. To this end, we are committed to removing barriers to competition so that competing providers are able to compete effectively with incumbent LECs and their affiliates in the provision of advanced services.[4] We are also committed to ensuring that incumbent LECs are able to make their decisions to invest in, and deploy, advanced telecommunications services based on market demand and their own strategic business plans, rather than on regulatory requirements. We intend to take deregulatory steps towards meeting this goal in a subsequent order.

4. In this order, we adopt several measures that we believe will promote competition in the advanced services markets. We fully expect that these measures will create incentives for providers of advanced services to innovate and to develop and deploy new technologies and services on a more efficient and expeditious basis. As a result, consumers will ultimately benefit through lower prices and increased choices in advanced services.

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line), and services based on packet-switched technology. xDSL technology is further described below at paras. 9-12.

[3] Although advanced services can also be deployed using other technologies over satellite, cable, and wireless systems, we limit the discussion here to wireline services. We use the term "wireline" in this order to refer to facilities that have traditionally been deployed by telephone companies. This is distinct from the coaxial and other cable facilities that have traditionally been deployed by cable companies.

[4] In a companion proceeding conducted pursuant to section 706 of the 1996 Act, we issued a Report to Congress that addresses the issue of whether the deployment of advanced services via all different mediums of telecommunication, such as wireline, wireless, cable, and satellite technologies, is both timely and reasonable. *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, CC Docket 98-146, Report, FCC 99-5 (rel. Feb. 2, 1999) (*Section 706 Report to Congress*); *see also* Pub.L. 104-104, Title VII, § 706 (b), Feb. 8, 1996, 110 Stat. 153, reproduced in the notes under 47 U.S.C. § 157. In this First Report and Order, we adopt rules that pertain only to the deployment of advanced services by means of wireline telecommunications.

II. OVERVIEW AND EXECUTIVE SUMMARY

A. Overview

5. Increasingly, electronic communications are becoming digital and are transmitted by means of "packet switching."[5] Packet-switched transmission of information promises a revolution in information, communications services, and entertainment by offering businesses, residential users, schools and libraries, and other end users of information the ability to access and send large amounts of information very quickly across the street or across the globe. Moreover, for wireline carriers, digital subscriber line technologies are making it possible for ordinary citizens to access various networks, such as the Internet, corporate networks, and governmental networks, at high speeds through the existing copper telephone lines that connect their residences or businesses to the incumbent LEC's central office. The existing infrastructure is being used in new ways that make available to average citizens a variety of new services and vast improvements to existing services.[6] The ability of all Americans to access these high-speed, packet-switched networks will likely spur our growth and development as a nation.

6. We adopt, in this order, additional measures to further facilitate the development of competition in the advanced services market. First, we strengthen our collocation rules to reduce the costs and delays faced by competitors that seek to collocate equipment in an incumbent LEC's central office. For example, we require incumbent LECs to make available to requesting competitive LECs shared cage and cageless collocation arrangements. Moreover, when collocation space is exhausted at a particular LEC location, we require incumbent LECs to permit collocation in adjacent controlled environmental vaults or similar structures to the extent technically feasible. Second, we adopt certain spectrum compatibility rules and adopt a Further Notice of Proposed Rulemaking (Further NPRM) to explore issues related to developing long-term standards and practices for spectrum compatibility and management. Finally, in the Further NPRM, we consider whether we should require LECs to allow competitors to offer advanced services to end users over the same line on which the LEC is offering voice service.

7. We intend to address, in a future order, other specific forms of regulatory relief that may be needed to stimulate investment and deployment of advanced services by incumbents or new entrants, or whether other changes to the Commission's local competition rules may facilitate deployment of advanced services by competing carriers. For example, in the *Advanced Services Order and NPRM,* we had proposed an option under which incumbent

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[5] *See, e.g., Section 706 Report to Congress* at paras. 20-25. Packet switching technologies segment information into small pieces, called packets, assigning each packet identifying characteristics as well as a destination address. The packets traverse the network, often following many different physical paths, until they arrive at their destination and are reassembled. *See* Newton's Telecom Dictionary, 14th Ed. 1998, at 527.

[6] *See, e.g., Section 706 Report to Congress* at para. 12.

LECs would be free to establish separate affiliates to provide advanced services that would not be subject to section 251(c) obligations if those affiliates were structured in a fashion so as not to be deemed a successor or assign of the incumbent.[7] We also sought comment on the applicability of section 251(c)(4) resale obligations to advanced services to the extent such services are exchange access services.[8] In addition, the NPRM proposed limited modifications of LATA boundaries. We also had set forth proposals in the *Advanced Services Order and NPRM* relating to incumbent LEC loop unbundling obligations.[9] We are deferring action on those issues and proposals.

B. Executive Summary

8. In the Order, we take the following steps:

Collocation

- Incumbent LECs must make available to requesting competitive LECs shared cage and cageless collocation arrangements. Moreover, when collocation is exhausted at a particular LEC location, incumbent LECs must permit collocation in adjacent controlled environmental vaults or similar structures to the extent technically feasible.

- A collocation method used by one incumbent LEC or mandated by a state commission is presumptively technically feasible for any other incumbent LEC.

- Incumbent LECs may adopt reasonable security measures to protect their central office equipment.

- Incumbent LECs may not require competitive LEC equipment to meet more stringent safety requirements than those the incumbent LEC imposes on its own equipment.

- Incumbent LECs must permit competitors to collocate all equipment used for interconnection and/or access to unbundled network elements (UNEs), even if it

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[7] *Deployment of Wireline Services Offering Advanced Telecommunications Capability*, CC Docket No. 98-147, Memorandum Opinion and Order and Notice of Proposed Rulemaking, FCC 98-188, at paras. 92-115 (rel. August 7, 1998) (*Advanced Services Order and NPRM*). In that NPRM we made specific proposals on how separate an affiliate would need to be so that it would not be deemed an incumbent LEC. *Id.* at paras. 92-115. We also sought comment on whether limited LATA boundary modifications or other targeted interLATA relief for Bell Operating Companies would be appropriate in certain circumstances. *Id.* at paras. 190-196.

[8] *Id.* at paras. 187-189.

[9] *Id.* at paras. 151-177.

includes a "switching" or enhanced services function, and incumbent LECs cannot require that the switching or enhanced services functionality of equipment be disengaged.

- Incumbent LECs must permit a competitive LEC to tour the entire central office in which that competitive LEC has been denied collocation space. Incumbent LECs must provide a list of all offices in which there is no more space. Incumbent LECs must remove obsolete, unused equipment, in order to facilitate the creation of additional collocation space within a central office.

- The collocation rules set forth in the Order serve as minimum standards, and permit any state to adopt additional requirements.

Spectrum Compatibility

- We adopt certain spectrum compatibility and management rules to allow competitive providers to deploy innovative advanced services technology in a timely manner. Specifically, any loop technology that complies with existing industry standards, has been successfully deployed by any carrier without significantly degrading the performance of other services, or has been approved by this Commission, any state commission, or an industry standards body is presumed acceptable for deployment. A LEC may not deny a carrier's request to deploy technology that is presumed acceptable for deployment, unless the LEC demonstrates to the state commission that deployment of the particular technology within the LEC network will significantly degrade the performance of other services.

- We also seek comment in the Further NPRM on measures that would facilitate timely development of long-term industry standards and practices on spectrum compatibility and management to facilitate deployment of new and innovative loop technologies.

Line Sharing

- In the Further NPRM, we tentatively conclude line sharing is technically feasible, and we seek comment on the operational, pricing, and policy ramifications to determine whether or not to mandate line sharing nationally.

III. BACKGROUND

A. Advanced Services Technologies

9. While the existing telephone network in the United States, with a line running into virtually every home and business, has provided superior voice telephony, until recently it was not thought suitable for the provision of interactive video or high speed data communications. First, the copper telephone wire running the "last mile" to each home, the

"local loop," was generally thought to be capable of carrying only a relatively modest stream of information. Second, the public telephone network is circuit-switched, that is, it maintains an end-to-end channel of communication for the entire duration of the call. Although this is a useful means of transmitting ordinary voice telephony, it is not efficient for transmitting data and other types of information.

10. xDSL technology, coupled with packet-switched networks, addresses both of these constraints. With xDSL technology, two modems are attached to each telephone loop: one at the subscriber's premises and the other at the telephone company's central office. The use of xDSL modems allows transmission of data over the copper loop at vastly higher speeds than can be achieved with analog data transmission.[10] Moreover, combining xDSL technology with packet switching permits more efficient use of the network because information generated by multiple users can be sent over a telecommunications facility that in a circuit-switched environment may be dedicated to only one customer for the duration of a call. In addition, the customer can potentially make ordinary voice calls over the public switched network at the same time as he or she is using the same line for high-speed data transmission.[11]

11. In circumstances in which the xDSL-equipped line carries both POTS ("plain old telephone service") and data channels, the carrier must separate those two streams when they reach the telephone company's central office. This is generally done by a device known as a digital subscriber line access multiplexer, or DSLAM. The DSLAM and central office xDSL modem send the customer's POTS traffic to the public, circuit-switched telephone network. The DSLAM sends the customer's data traffic (combined with that of other xDSL users) to a packet-switched data network. Thus, the data traffic, after traversing the local loop, avoids the circuit-switched telephone network altogether.

12. Once on the packet-switched network, the data traffic is routed to the location selected by the customer, for example, a corporate local area network or an Internet service

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[10] An ordinary voice channel, in the United States, generally allows transmission of digital information at the rate of up to 56,000 bits per second. By contrast, the most widely deployed xDSL service (known as ADSL) allows data to be transmitted to the home or residence at up to several *million* bits per second, depending on loop length, loop design, and the technology deployed. Provision of xDSL service is subject to a variety of important technical constraints. One is the length of the subscriber loop: ADSL, the most widely deployed xDSL-based service, generally requires loops of less than 18,000 feet using current technology. Another is the quality of the loop, which must be free of excessive bridged taps, loading coils, and other devices commonly used to aid in the provision of analog voice and data transmission, but which interfere with the provision of xDSL services. "Conditioning" loops to remove those impediments, or constructing fiber-based digital loop carrier systems to overcome loop length difficulties, can be expensive.

[11] We note that, at the present time, not all existing xDSL deployments are taking advantage of that capability; some carriers offer only high-speed data services without the voice component over the xDSL-equipped loop.

provider. That location may itself be a gateway to a new packet-switched network or set of networks, like the Internet.

B. Statutory Framework

13. In the 1996 Act, Congress established a "pro-competitive, deregulatory national policy framework" for telecommunications, opening all telecommunications markets to competition so as to make advanced telecommunications and information technologies and services available to all Americans.[12] At the core of the Act's market-opening provisions is section 251.[13] In section 251, Congress sought to open local telecommunications markets to competition by, among other things, reducing economic and operational advantages possessed by incumbents.

14. Section 251 requires incumbent LECs to share their networks in a manner that enables competitors to choose among three methods of entry -- the construction of new networks, the use of unbundled elements of the incumbent's network, and resale of the incumbent's retail services. Section 251(a) requires all "telecommunications carriers" to "interconnect directly or indirectly with the facilities and equipment of other telecommunications carriers."[14] Section 251(c)(3) requires incumbent LECs to provide nondiscriminatory access to unbundled network elements.[15] In addition, section 251(c)(6) imposes an obligation on incumbent LECs "to provide, on rates, terms and conditions that are just, reasonable, and nondiscriminatory, for physical collocation of equipment necessary for interconnection or access to unbundled network elements. . . ."[16] Finally, for competitors that seek to compete by reselling the incumbent LEC's services, section 251(c)(4) requires incumbent LECs to offer for resale at wholesale rates "any telecommunications service that the carrier provides at retail to subscribers who are not telecommunications carriers."[17]

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[12] *Joint Explanatory Statement*, *supra* n.2.

[13] 47 U.S.C. § 251.

[14] 47 U.S.C. § 251(a); *see also Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, CC Docket No. 96-98, First Report and Order, 11 FCC Rcd 15499, 15594 at para. 184 (1996) (*Local Competition First Report and Order*).

[15] 47 U.S.C. § 251(c)(3); *see also Local Competition First Report and Order*, 11 FCC Rcd at 15640, para. 278.

[16] 47 U.S.C. § 251(c)(6).

[17] 47 U.S.C. § 251(c)(4).

C. Procedural History

15. On August 7, 1998, we released the *Advanced Services Order and NPRM,* in response to six petitions suggesting action we should take to speed the deployment by wireline carriers of advanced services.[18] In that order, we concluded, *inter alia*, that the pro-competitive provisions of the 1996 Act are technology-neutral and thus apply equally to advanced services and to circuit-switched voice services. We therefore concluded that incumbent LECs are subject to section 251(c) in their provision of advanced services.[19] Specifically, we found that incumbent LECs are subject to the interconnection obligations of section 251(a) and 251(c)(2) with respect to both their circuit-switched and packet-switched networks.[20] We also clarified that the facilities and equipment used by the incumbent LECs to provide advanced services are network elements and generally subject to the obligations in section 251(c)(3).[21] In response to the petitions of Ameritech, Bell Atlantic, SBC and U S WEST requesting us to forbear from applying the requirements of section 251(c), or section 271, or both with respect to their provision of advanced services, we concluded that we lacked the statutory authority to do so and therefore denied those petitions.[22]

16. In the *Advanced Services Order and NPRM,* we proposed, in relevant part, to strengthen collocation requirements to foster timely, cost-effective, competitive deployment of

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[18] *Commission Seeks Comment on Bell Atlantic Petition for Relief from Barriers to Deployment of Advanced Telecommunications Services,*CC Docket No. 98-11, Public Notice, 12 FCC Rcd 2495 (1998); *Alliance for Public Technology Petitions the Commission for Issuance of a Notice of Inquiry and a Notice of proposed Rulemaking to Implement Section 706 of the Telecommunications Act,* RM 9844, Public Notice, 13 FCC Rcd 5126 (1998); *Commission Seeks Comment on U S West Petition for Relief from Barriers to Deployment of Advanced Telecommunications Services,* CC Docket No. 98-26, Public Notice, 13 FCC Rcd 4739 (1998); *Commission Seeks Comment on Ameritech Petition for Relief from Barriers to Deployment of Advanced Telecommunications Services,* CC Docket No. 98-32, Public Notice, 13 FCC Rcd 4741 (1998); *Pleading Cycle Established for Comments on Association for Local Telecommunication Services Petition for Declaratory Ruling Regarding Section 706,* CC Docket No. 98-78, Public Notice, DA 98-1019 (rel. May 28, 1998); *Pleading Cycle Established for Comments on SBC Petition for Relief from Regulation Pursuant to Section 706 of the Telecommunications Act and 47 U.S.C.§ 160 for ADSL Infrastructure and Service,* CC Docket No. 98-91, Public Notice, DA 98-1111 (rel. June 11, 1998).

[19] *Advanced Services Order and NPRM* at paras. 11, 18, 57.

[20] *Id.* at paras. 11, 46-49.

[21] *See id.* at paras. 50-58.

[22] *See id.* at paras. 69-82. Section 271 conditions the provision of in-region, interLATA services by BOCs on compliance with certain requirements, including compliance with a competitive checklist. The critical market-opening requirements of section 251 are incorporated into this competitive checklist. Thus, through section 271, Congress requires BOCs to demonstrate that they have opened their local markets to competition before they are authorized to enter the in-region long distance market.

advanced services.[23] We also proposed to establish spectrum compatibility and management guidelines so that multiple carriers could deploy advanced technologies on common facilities.

17. On January 25, 1999, the Supreme Court released an opinion in *AT&T Corp. v. Iowa Utilities Board*[24] in which it addressed the Commission's rule setting forth those network elements that incumbent LECs must make available to competitors. The Court held that the Commission did not adequately consider the standards of section 251(d)(2) in determining which network elements must be unbundled pursuant to section 251(c)(3). The Court stated that the Commission's rule setting forth the network elements that incumbent LECs must make available to requesting carriers should be vacated, and it remanded the matter for further proceedings.[25] We are currently reviewing the section 251(d)(2) standard consistent with the Supreme Court opinion in *Iowa Utilities Board*, and will seek further comment on the issue of whether network elements used in the provision of advanced services should be unbundled.

IV. FIRST REPORT AND ORDER

A. Measures to Encourage Competitive LEC Deployment of Advanced Services

1. Overview

18. In this section we adopt additional measures that we expect will further facilitate competitive deployment of advanced services. In order to enable competitive LECs to compete effectively with incumbents in the advanced services marketplace, we establish additional standards and rules that will strengthen our collocation requirements, thereby reducing costs and delays associated with competitors collocating in an incumbent LEC's central office. We also adopt certain spectrum compatibility and management rules to allow competitive providers to deploy innovative advanced services technology in a timely manner. We acknowledge that the rules we adopt in this Order focus on the provision of advanced services, but we emphasize that the actions we take today pursuant to the Act apply to all telecommunications services, whether traditional voice services or advanced services.

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[23] *See id.* at paras. 118-150.

[24] *Iowa Utilities Board*, 119 S.Ct. 721 (1999).

[25] *Id.* at 733-36.

2. Collocation Requirements

a. Background

19. In 1992, in the *Expanded Interconnection* proceeding,[26] the Commission adopted rules pursuant to section 201 of the Act that required certain incumbent LECs to offer physical and virtual collocation[27] for parties seeking to locate interstate special access and switched transport transmission facilities at LEC premises.[28]

20. Section 251(c)(6) of the 1996 Act requires incumbent LECs to "provide, on rates terms and conditions that are just, reasonable, and nondiscriminatory, for physical collocation of equipment necessary for interconnection or access to unbundled network elements at the premises of the local exchange carrier, except that the carrier may provide for virtual collocation if the local exchange carrier demonstrates to the State commission that

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[26] *Expanded Interconnection with Local Telephone Company Facilities*, CC Docket No. 91-141, *Amendment of the Part 69 Allocation of General Support Facility Costs*, CC Docket No. 92-222, Report and Order and Notice of Proposed Rulemaking, 7 FCC Rcd 7369 (1992), *vacated in part and remanded, Bell Atlantic v. FCC*, 24 F.3d 1441 (1994); *First Reconsideration*, 8 FCC Rcd 127 (1993); *Second Reconsideration*, 8 FCC Rcd 7341 (1993); *Second Report and Order*, 8 FCC Rcd 7374 (1993); *Memorandum Opinion and Order*, 9 FCC Rcd 5154 (1994), *remanded, Pacific Bell v. FCC*, 81 F.3d 1147 (1996).

[27] In a physical collocation arrangement, a competitor leases space at a LEC's premises for its equipment. The competing provider has physical access to this space to install, maintain, and repair its equipment. *See Local Competition First Report and Order*, 11 FCC Rcd at 15784, n.1361; *Expanded Interconnection with Local Telephone Company Facilities*, First Report and Order, 7 FCC Rcd 7369, 7391 at para. 42 (1992) (*Special Access Order*). In a virtual collocation arrangement, the competitor designates the equipment to be placed at the incumbent LEC's premises. The competing provider, however, does not have physical access to the incumbent's premises. Instead, the equipment is under the physical control of the incumbent LEC, and the incumbent is responsible for installing, maintaining, and repairing the competing provider's equipment. *See Local Competition First Report and Order*, 11 FCC Rcd at 15785, para. 559; *Virtual Collocation Order*, 9 FCC Rcd 5154, 5158 at para. 7 (1994).

[28] Interstate access is a service traditionally provided by local telephone companies and enables interexchange carriers and other customers to originate and terminate interstate telephone traffic. Special access is a form of interstate access that uses dedicated transmission lines between two points, without switching the traffic on those lines. Switched transport is another form of interstate access comprising the transmission of traffic between interexchange carriers' (or other customers') points of presence and local telephone companies' end offices, where the traffic is switched and routed to end users. *Local Competition First Report and Order*, 11 FCC Rcd at 15784, n.1359. In the *Expanded Interconnection* proceeding, the Commission adopted rules governing, among other things, space allocation and exhaustion, types of equipment that could be collocated, and LEC premises where parties could collocate equipment. In 1994, the United States Court of Appeals for the District of Columbia Circuit concluded that the Commission lacked the authority under section 201 of the Act to require physical collocation and remanded all other issues to the Commission. *Bell Atlantic v. FCC*, 24 F.3d 1441 (D.C. Cir. 1994). On remand, the Commission adopted rules, which remain in place today, for both special access and switched transport that required LECs to provide either virtual or physical collocation. *Virtual Collocation Order*, 9 FCC Rcd 5154.

physical collocation is not practical for technical reasons or because of space limitations."[29] In the *Local Competition First Report and Order*, the Commission adopted specific rules to implement the collocation requirements of section 251(c)(6).[30] In the *Advanced Services Order and NPRM*, we tentatively concluded that we should adopt additional collocation rules, as urged by ALTS, to ensure that competing providers have access to the physical collocation space they need in order to offer advanced services.[31]

21. Consumer demand for advanced services is increasing exponentially, and competitive LECs and incumbent LECs alike are rushing to meet that demand. Competitive LECs rely on the incumbents to provision collocation space for the equipment needed to provide advanced services, and these new entrants cannot meet consumer demand for advanced services absent reasonable and nondiscriminatory collocation arrangements.[32] For example, any xDSL-based services provided over unbundled local loops would require location of a DSLAM within a reasonable distance of the customer's premises, usually less than 18,000 feet. As such, competitive LECs generally must collocate their DSLAMs in the incumbent LEC's premises where the customer's unbundled loop terminates. Absent viable collocation arrangements, the customer will not have a choice of LECs from which to purchase advanced services. As discussed in greater detail below, we now adopt several collocation measures that we consider critical steps in encouraging the competitive provision of advanced services.

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[29] 47 U.S.C. § 251(c)(6).

[30] 47 C.F.R. §§ 51.321, 51.323; *see Local Competition First Report and Order*, 11 FCC Rcd at 15782-15811, paras. 555-617. These rules were specifically upheld by the Eighth Circuit in *Iowa Utilities Board v. FCC*, 120 F.3d 753, 818 (8th Cir. 1997), *affirmed in part and reversed in part sub nom, AT&T Corp. v. Iowa Utilities Board*, 119 S.Ct. 721 (1999).

[31] *See Advanced Services Order and NPRM* at paras. 118-150.

[32] *See, e.g.*, Covad Comments at 20 (". . . the current cost of physical collocation is the single largest one-time, single source cost Covad has . . ."); e.spire Comments at 21 ("The unavailability and exorbitant expense of physical collocation in [incumbent] LEC central offices is a substantial barrier to [competitive] LEC efforts to deploy advanced telecommunications capability"); Qwest Comments at 50-51 ("Widespread geographic deployment of advanced services will require additional measures by the Commission to require [incumbent] LECs to allow cost effective collocation"); MCI Worldcom Comments at 58 (". . . up-front costs charged by the [incumbent] LECs, [incumbent] LEC claims of space limitations, and the [incumbent] LECs' refusal to consider alternatives other than virtual collocation . . . are critical factors resulting in excessive delays for the deployment of traditional and advanced local services").

b. Adoption of National Standards

(1) Background

22. In the *Local Competition First Report and Order*, the Commission adopted minimum requirements for nondiscriminatory collocation arrangements.[33] The Commission adopted rules for, among other things, space allocation and exhaustion, types of equipment that could be collocated, and LEC premises where parties could collocate equipment.[34] The Commission also concluded that state commissions should have the flexibility to adopt additional collocation requirements that are otherwise consistent with the Act and the Commission's regulations.[35] In the *Advanced Services Order and NPRM*, we sought comment on the extent to which we should establish additional national rules for collocation pursuant to sections 201 and 251 in order to remove barriers to entry and speed the deployment of advanced services.[36]

(2) Discussion

23. We adopt our tentative conclusion to establish additional national rules for collocation.[37] We emphasize that the collocation measures we adopt in this order apply to all telecommunications services, including advanced services and traditional voice services. The standards and rules we implement in this proceeding will serve as minimum requirements. We note that state commissions commenting in this proceeding generally support our proposal to adopt additional national rules.[38] We conclude that states will continue to have the flexibility to respond to specific issues by imposing additional requirements.[39] For example,

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[33] *Local Competition First Report and Order*, 11 FCC Rcd at 15782-15811, paras. 555-617. The relevant collocation requirements are summarized in the following sections dealing with specific collocation issues.

[34] *Id.*

[35] *Id.* at para. 558. *See* AT&T Comments at 72.

[36] *Advanced Services Order and NPRM* at para. 123.

[37] *See* Covad Comments at 5 ("Fundamental (indeed, axiomatic) to the provision of competitive, broadband services 'to all Americans' is the ability for entrants to obtain physical collocation arrangements in every central office") (emphasis in the original); Allegiance Comments at 2 ("Adoption of national standards would encourage the deployment of advanced services by increasing predictability and certainty, and by facilitating entry by competitors operating in several states"); Qwest Comments at 51; NY PUC Comments at 9-10; KMC Comments at 13; ICG Comments at 16; Texas PUC Comments at 7; NEXTLINK Comments at 12.

[38] *See* Minn. DPS Comments at 17; Texas PUC Comments at 7; Ill. Commerce Comm. Comments at 8.

[39] *See, e.g.*, NY PUC Comments at 9-10 ("any rules adopted by the Commission should not interfere with additional state approved options"); Ill. C.C. Comments at 8 (supporting national standards with "recognition of state authority over these items").

although we do not adopt at this time specific provisioning intervals for collocation space preparation, we appreciate the efforts of the Texas Public Utilities Commission and other states that have worked hard to ensure that collocation is provisioned in a timely manner.[40] State commissions play a crucial role in furthering the goals of our collocation rules by enacting rules of their own that, in conjunction with federal rules, ensure that collocation is available in a timely manner and on reasonable terms and conditions. In addition, as we noted in the NPRM, competitive LECs can pursue remedies for violations of our collocation requirements before the Commission and the appropriate state commissions.[41]

24. We do not agree with the comments of certain incumbent LECs that national rules are unnecessary because there are no remaining collocation issues that require federal involvement.[42] As discussed more fully below, there are numerous problems that remain with provisioning of collocation space, and we believe that there are concrete steps we can take, in conjunction with the ongoing work of state commissions, to further the pro-competitive goals of the 1996 Act.

c. Collocation Equipment

(1) Background

25. Section 251(c)(6) requires incumbent LECs to allow collocation of "equipment necessary for interconnection or access to unbundled network elements . . . ."[43] In the *Local Competition First Report and Order*, the Commission concluded that section 251(c)(6) requires collocation of equipment used for: (1) interconnection for "the transmission and routing of telephone exchange service and exchange access" pursuant to section 251(c)(2); and (2) access to unbundled network elements for "the provision of a telecommunications service" pursuant to section 251(c)(3).[44] The Commission interpreted section 251(c)(6) as

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[40] Texas PUC Comments at 11-12.

[41] *Advanced Services Order and NPRM* at para. 125. *See Implementation of the Telecommunications Act of 1996 - Amendment of Rules Governing Procedures to be Followed When Formal Complaints are Filed Against Common Carriers*, CC Docket No. 96-238, Second Report and Order, 13 FCC Rcd. 17018. (1998).

[42] *See, e.g.*, U S WEST Comments at 36 (proposed Commission action on collocation "aims to fix a problem that is not broken"); SBC Reply at 19 ("Inflexible nationwide collocation rules are simply not feasible."); GTE Reply at 53 (national rules are "impractical"); Ameritech Comments at 33; Bell Atlantic Reply at 50-51.

[43] 47 U.S.C. § 251(c)(6).

[44] *Local Competition First Report and Order*, 11 FCC Rcd at 15795, para. 581. *See* AT&T Comments at 74.

requiring incumbent LECs to permit competitors to collocate equipment that is "used and useful" for either interconnection or access to unbundled network elements.[45]

26. The Commission concluded in the *Local Competition First Report and Order* that new entrants may collocate transmission equipment, including optical terminating equipment and multiplexers, on incumbent LEC premises.[46] The Commission further concluded, at the time, that incumbent LECs need not permit the collocation of other types of equipment, including switching equipment and equipment used to provide enhanced services.[47] With respect to switching equipment, however, the Commission recognized that "modern technology has tended to blur the line between switching equipment and multiplexing equipment."[48] This trend in manufacturing has benefited service providers and their customers by reducing costs, promoting efficient network design, and expanding the range of possible service offerings.[49] As a consequence of this integration, certain equipment that competing carriers need to collocate to provide advanced services efficiently may also perform switching functions.[50] Because incumbent LECs are currently not required by our rules to permit collocation of switching equipment, competing providers argue that incumbent LECs have delayed competitive entry by contesting, on a case-by-case basis, the functionality of a particular piece of equipment (which may perform switching functions in addition to its other functions) and whether it may be collocated.[51]

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[45] *Local Competition First Report and Order*, 11 FCC Rcd at 15794, para. 579.

[46] *Id.* at 15794, para. 580.

[47] *Id.* at 15795, para. 581; 47 U.S.C. § 51.323(c). The Commission noted that switching equipment generally performs functions other than providing interconnection or access to unbundled network elements. *Local Competition First Report and Order*, 11 FCC Rcd at 15795, n.1417. The Commission indicated that it might reexamine the issue of collocation of switching equipment if it appeared that "such action would further achievement of the 1996 Act's procompetitive goals." *Id.* at 15795, para. 581.

[48] *Id.* at 15795, para. 581. *See* Covad Comments at 22; AT&T Comments at 74; Sprint Comments at 11.

[49] *See* Covad Comments at 22; AT&T Comments at 74; Sprint Comments at 11.

[50] *See* Covad Comments at 22; AT&T Comments at 74; Sprint Comments at 11.

[51] *See* Covad Comments at 22; AT&T Comments at 74; Sprint Comments at 11. *See also* US Xchange Comments at 7; Qwest Comments at 54.

(2) Discussion

27. Equipment with switching and enhanced services functionality. In the *Advanced Services Order and NPRM*, we tentatively concluded that incumbent LECs should not be permitted to impede competing carriers from offering advanced services by imposing unnecessary restrictions on the type of equipment that competing carriers may collocate.[52] We sought comment on whether we should require incumbent LECs to allow new entrants to collocate any equipment that is used for interconnection and access to unbundled network elements, even if such equipment also includes a switching functionality.[53] Specifically, we asked if collocation of equipment that performs both switching and other functions would encourage competitive LECs to use integrated equipment that otherwise might not be allowed in incumbent LEC premises.[54]

28. We agree with commenters that our existing rules, correctly read, require incumbent LECs to permit collocation of all equipment that is necessary for interconnection or access to unbundled network elements, regardless of whether such equipment includes a switching functionality, provides enhanced services capabilities, or offers other functionalities.[55] Our rules obligate incumbent LECs to "permit the collocation of any type of equipment used for interconnection or access to unbundled network elements."[56] Stated differently, an incumbent LEC may not refuse to permit collocation of any equipment that is "used or useful" for either interconnection or access to unbundled network elements,

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[52] *Advanced Services Order and NPRM* at para. 129. *See* Covad Comments at 22; AT&T Comments at 73; MCI Worldcom Comments at 60; Sprint Comments at 11.

[53] *Advanced Services Order and NPRM* at para. 129.

[54] *Id.*

[55] *See* NTIA Jan. 11, 1999 *Ex Parte* at 19 ("any attempt to distinguish, for collocation purposes, between switching equipment and interconnection equipment will be unsustainable given the trend in manufacturing to integrate multiple functions into telecommunications equipment"); AT&T Comments at 77; Intermedia Comments at 32; Sprint Comments at 12.

[56] 47 C.F.R. § 51.323(b). In *Iowa Utilities Board*, the Supreme Court found that the Commission's rules identifying which network elements must be unbundled should be vacated. The Commission will soon initiated a proceeding to address the issues raised in the Supreme Court's opinion and identify unbundled network elements. In the interim, incumbent LECs have agreed to continue providing unbundled network elements that they had been providing pursuant to interconnection agreements before the Supreme Court's opinion. In requiring incumbent LECs to permit collocation of equipment necessary for access to unbundled network elements, we expect incumbents to continue providing collocation for equipment necessary to access the network elements they have committed to continue providing. When the Commission concludes its proceeding and again identifies network elements, incumbents must permit collocation of equipment necessary for access to those unbundled network elements, consistent with the rules expressed herein.

regardless of other functionalities inherent in such equipment.[57] Rather, our rules require incumbent LECs to permit collocation of any equipment required by the statute unless they first "prove to the state commission that the equipment will not be actually used by the telecommunications carrier for the purpose of obtaining interconnection or access to unbundled network elements."[58] We further agree with commenters that this rule requires incumbent LECs to permit competitors to collocate such equipment as DSLAMs, routers, ATM multiplexers, and remote switching modules.[59] Nor may incumbent LECs place any limitations on the ability of competitors to use all the features, functions, and capabilities of collocated equipment, including, but not limited to, switching and routing features and functions.

29. We consider this clarification of our existing rules to be particularly important given the rapid pace of technological change in the telecommunications equipment marketplace. Several commenters contend that incumbent LECs are refusing to permit collocation of advanced services equipment that, while used or useful for interconnection or access to unbundled network elements, also contains, for example, a switching functionality.[60] For example, we note that remote switching modules, which terminate circuits and perform multiplexing and switching functions, do not function as stand-alone switches, but rather provide integrated functionalities in a single piece of equipment.[61] By clarifying that incumbent LECs must permit such equipment to be collocated on their premises, we take an important step towards elimination of obstacles to competition. In order to compete effectively in the advanced services marketplace, competitive telecommunications providers

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[57] *Local Competition First Report and Order*, 11 FCC Rcd at 15794, para. 579 (interpreting "necessary" as that term is used in 47 U.S.C. § 251(c)(6) as meaning equipment that is "used" or "useful" and not, as commenters had suggested, "indispensable"). We note that in its recent decision in *Iowa Utilities Board* the Supreme Court reviewed the Commission's interpretation of the word "necessary" in the context of unbundled network elements. The Supreme Court held that the Commission had not adequately given effect to the standard found in section 251(d)(2) that, in deciding which elements must be unbundled, the Commission consider whether "access to such network elements as are proprietary in nature is necessary." *Iowa Utilities Board*, 119 S.Ct. at 734. The Commission's implementation of the requirement in section 251(c)(6) that incumbent LECs permit collocation of "equipment *necessary* for interconnection or access to unbundled network elements," 47 U.S.C. 251(c)(6) (emphasis added), was not challenged before the Supreme Court and the Commission's rules remain in effect.

[58] 47 C.F.R. §§ 51.323 (b), (c).

[59] *See* Intermedia Comments at 32; KMC Comments at 14; xDSL Networks Comments at 12-13; Sprint Comments at 11.

[60] *See* MCI Worldcom Comments at 61; Covad Comments at 20; Qwest Comments at 54.

[61] *See* AT&T Comments at 75; Intermedia Comments at 32. SBC notes that it currently permits collocation of remote switching modules in its central offices. SBC Comments at 16. *See also MCI v. Bell Atlantic*, No. 97-3076, slip op. at 17-20 (D.D.C. Feb. 15, 1999) (finding, *inter alia*, collocation of remote switching modules consistent with the Act and *Local Competition First Report and Order*).

must be permitted to collocate integrated equipment that lowers costs and increases the services they can offer their customers.

30. We continue to decline, however, to require incumbent LECs to permit the collocation of equipment that is not necessary for either access to UNEs or for interconnection, such as equipment used exclusively for switching or for enhanced services.[62] Although we may explore requiring such collocation in the future, we do not find sufficient support in the record at this time for such a requirement. We reiterate that incumbent LECs are obligated, pursuant to section 251(c)(6), to permit competitors to collocate multi-functional equipment, even equipment that includes switching or enhanced services functionalities, if such equipment is necessary for access to UNEs or for interconnection with the incumbent LEC's network.

31. We do not agree with the contention of certain commenters that the statute does not authorize the Commission to impose such a requirement.[63] This contention is premised on the assumption that requiring incumbent LECs to permit collocation of equipment with a switching or enhanced services functionality, as long as that equipment is used or useful for interconnection with the incumbent's network or access to unbundled network elements, would constitute an unlawful taking. As the Commission stated in the *Local Competition First Report and Order*, section 251(c)(6) "*expressly* requires incumbent LECs to provide physical collocation, absent space or technical limitations," and thus physical collocation is not, the Commission concluded, an unlawful taking.[64] Because the statute authorized the Commission to require incumbent LECs to permit physical collocation, the only takings-related issue in ordering physical collocation, the Commission concluded, was just compensation.[65] Even assuming, *arguendo*, that our revised collocation rules constitute a taking, they do not constitute an unlawful taking, because such action would clearly be for a public purpose, pursuant to express statutory authorization, and our implementation provides for just compensation.[66] We conclude that to interpret section 251(c)(6) as denying competitive carriers the ability to collocate multi-functional equipment in incumbent LEC

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[62] *See Local Competition First Report and Order*, 11 FCC Rcd at 15795 (declining to impose a requirement that stand alone switches or enhanced services equipment be collocated).

[63] *See, e.g.*, Bell Atlantic Reply at 49 ("whether included in multi-functional equipment or stand-alone devices, the Commission simply may not lawfully require collocation of equipment or other functions that are not used for the limited purposes specified in the Act").

[64] *Local Competition First Report and Order*, 11 FCC Rcd at 15811, para. 616 (emphasis in the original).

[65] *Id.* at 15811, para. 617.

[66] *See Bell Atlantic Companies v. FCC*, 24 F.3d 1441 (D.C. Cir. 1994) (holding that, if agency action constitutes an otherwise lawful taking, courts still require express, or necessarily implied, statutory authority for the agency action).

central offices would place competitors at an unreasonable competitive disadvantage. Given the technological trend towards integrated telecommunications equipment, requiring competitive LECs to purchase single-function equipment would relegate competitors to less efficient equipment and create unnecessary roadblocks to competitive entry.[67] Section 251(c)(6) mandates incumbent LECs permit competing carriers to collocate any equipment that is either used or useful for interconnection or access to unbundled network elements, regardless of any other functionalities that may be offered by that equipment. Equipment that meets the used or useful test falls squarely within the parameters of section 251(c)(6).[68]

32. Cross-Connects. In the *Advanced Services Order and NPRM*, we noted ALTS' contention that some incumbent LECs do not allow competitive LECs to interconnect their collocated equipment with that of other collocating carriers.[69] We observed that, pursuant to our current rules, an incumbent LEC is required to allow competing carriers to establish cross-connects to the collocated equipment of other competing carriers at the incumbent's premises.[70] The Commission did not, however, expressly require incumbent LECs to permit competitors to construct their own connecting transmission facilities.[71] We sought comment on any additional steps we might take so that competitive LECs are able to establish cross-connects to the equipment of other collocated competitive LECs.

33. We now revise our rules to require incumbent LECs to permit collocating carriers to construct their own cross-connect facilities between collocated equipment located on the incumbent's premises. No incumbent LECs objected specifically to permitting competitive LECs to provision their own cross-connect facilities. Although we previously did not require incumbent LECs to permit collocating carriers to construct their own cross-connect facilities, we did not prevent incumbent LECs from doing so.[72] Several competitive LECs raise the issue of delay and cost associated with incumbent LEC provision of cross-

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[67] *See* Nortel Comments at 4 (disabling switching functions in integrated equipment serves to "preclude cost-effective deployment of advanced services and force higher costs onto carriers and ultimately onto consumers"); MCI Worldcom Comments at 61; Covad Comments at 20 (clarification will allow competitors to "build more efficient and fault-tolerant networks capable of innovative evolution at much lower costs"); Qwest Comments at 54 ("Allowing competitors to use integrated equipment that performs multiple functions will promote efficient network design and reduce costs to consumers"); US Xchange Comments at 7 (such rules will allow competitors to "take advantage of more efficient integrated equipment"); Texas PUC Comments at 8.

[68] *Local Competition First Report and Order*, 11 FCC Rcd at 15794, para. 579.

[69] *Advanced Services Order and NPRM* at para. 133.

[70] *Id.* *See* 47 C.F.R. § 51.323(h); *Local Competition First Report and Order*, 11 FCC Rcd at 15801-02, paras. 594-95.

[71] *Id.*

[72] 47 C.F.R. § 51.323(h)(1).

connect facilities, which are often as simple as a transmission facility running from one collocation rack to an adjacent rack.[73] We see no reason for the incumbent LEC to refuse to permit the collocating carriers to cross-connect their equipment, subject only to the same reasonable safety requirements that the incumbent LEC imposes on its own equipment.[74] Even where competitive LEC equipment is collocated in the same room as the incumbent's equipment, we require the incumbent to permit the new entrant to construct its own cross-connect facilities, using either copper or optical facilities, subject only to the same reasonable safety requirements the incumbent places on its own similar facilities.[75] Moreover, we agree with Intermedia that incumbent LECs may not require competitors to purchase any equipment or cross-connect capabilities solely from the incumbent itself at tariffed rates.[76]

34. Equipment Safety Requirements. In the *Advanced Services Order and NPRM*, we tentatively concluded that incumbent LECs may require that all equipment that a new entrant places on its premises meet safety requirements to avoid endangering other equipment and the incumbent LECs' networks.[77] Certain performance and reliability requirements, however, may not be necessary to protect LEC equipment.[78] Such requirements may increase costs unnecessarily, which would lessen the ability of new entrants to serve certain markets and thereby harm competition. We tentatively concluded that, to the extent that incumbent LECs use equipment that does not satisfy the Bellcore Network Equipment and Building Specifications (NEBS) requirements, competitive LECs should be able to collocate the same or equivalent equipment. We further tentatively concluded that incumbent LECs should be required to list all approved equipment and all equipment they use.[79]

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[73] *See* e.spire Comments at 25-26; ICG Comments at 16-20; Intermedia Comments at 27-28; Texas PUC Comments at 8; Allegiance Comments at 4.

[74] *See infra* para. 36.

[75] *See* Level 3 Comments at 12.

[76] *See* Intermedia Comments at 38.

[77] *Advanced Services Order and NPRM* at para. 134. Incumbent LECs generally require that equipment collocated at their premises complies with Bellcore's Network Equipment and Building Specifications (NEBS). These specifications, which tend to increase the cost of equipment, include both safety requirements (NEBS Level 1), such as fire prevention specifications, and performance requirements (NEBS Levels 2 and 3).

[78] *Id.* at para. 135.

[79] In the *Advanced Services Order and NPRM*, we suggested that equipment reliability standards may be better left to the mutual agreement of the competitive LEC, its customers, and its equipment providers. By requiring competitive LECs to satisfy NEBS performance requirements, on top of NEBS safety requirements, competitive LECs may be compelled to engage in unnecessary, costly, and lengthy testing which could delay competitive LECs' ability to provide advanced services. *Advanced Services Order and NPRM* at para. 135 n.253. *See* e.spire Comments at 28 (allowing incumbent LECs to impose NEBS performance requirements imposes "unreasonable, costly and burdensome" requirements on competitive LECs).

35. We conclude that, subject to the limitations described herein, an incumbent LEC may impose safety standards that must be met by the equipment to be collocated in its central office. First, we agree with commenters that NEBS Level 1 safety requirements are generally sufficient to protect competitive and incumbent LEC equipment from harm.[80] NEBS safety requirements, originally developed by the Bell Operating Companies' own research arm, are generally used by incumbent LECs for their own central office equipment, so we conclude that NEBS adequately address the safety concerns raised by incumbent LECs when competitors introduce their own equipment into incumbent LEC central offices.[81] We reject SBC's argument that equipment safety and performance standards should vary from location to location and that no general rules of applicability should be imposed.[82] While we agree that equipment safety standards are important to protect incumbent LEC central offices, we also believe that as a matter of federal policy, there should be a common set of safety principles that carriers should meet, regardless of where they operate. We agree with those commenters that contend that NEBS requirements that address reliability of equipment, rather than safety, should not be used as grounds to deny collocation of competitive LEC equipment.[83] Thus, an incumbent LEC may not refuse to permit collocation of equipment on the grounds that it does not meet NEBS performance, rather than safety, requirements.[84]

36. Second, we conclude that, although an incumbent LEC may require competitive LEC equipment to satisfy NEBS safety standards, the incumbent may not impose safety requirements that are more stringent than the safety requirements it imposes on its own equipment that it locates in its premises.[85] Because incumbent LECs generally have been setting their own rules for the safety standards that collocating carriers must adhere to, we need to adopt measures that reduce incentives for discriminatory action. We agree with commenters' suggestion that an incumbent LEC that denies collocation of a competitor's equipment, citing safety standards, must provide to the competitive LEC within five business days a list of all equipment that the incumbent LEC locates within the premises in question, together with an affidavit attesting that all of that equipment meets or exceeds the safety

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[80] *See* MCI Worldcom Comments at 62 (competitive LECs "must be given a level of certainty with respect to acceptable equipment"); Sprint Comments at 13; AT&T Comments at 78.

[81] *See Advanced Services Order and NPRM* at para. 134.

[82] *See* SBC Comments at 18-19.

[83] *See* Covad Comments at 25; AT&T Comments at 78; Sprint Comments at 13; Allegiance Comments at 4; DATA Reply at 22; Intermedia Comments at 37.

[84] *See supra* n.79 and accompanying text.

[85] *See* Covad Comments at 24-25; Qwest Comments at 55; AT&T Comments at 78; DATA Reply at 22; Illinois C.C. Comments at 9-10; Sprint Comments at 13; KMC Comments at 15.

standard that the incumbent LEC contends the competitor's equipment fails to meet.[86] We find that absent such a requirement, incumbent LECs may otherwise unreasonably delay the ability of competitors to collocate equipment in a timely manner. For example, without this requirement, incumbents could unfairly exclude competitors' equipment for failing to meet safety standards that the incumbent's own equipment does not satisfy, or may unreasonably refuse to specify the exact safety requirements that competitors' equipment must satisfy.

d. Alternative Collocation Arrangements

(1) Background

37. In the *Advanced Services Order and NPRM*, we made several tentative conclusions and sought comment on issues raised by ALTS in its petition contending that the practices and policies that incumbent LECs employed in offering physical collocation impeded competition by imposing substantial costs and delays on competing carriers for space and construction of collocation cages.[87] Based on the record submitted in this proceeding, we now adopt several of our tentative conclusions related to the provisioning of collocation space in incumbent LEC premises.

38. In the *Advanced Services Order and NPRM*, we tentatively concluded that we should require incumbent LECs to offer collocation arrangements to new entrants that minimize the space needed by each competing provider in order to promote the deployment of advanced services to all Americans.[88] Such alternative collocation arrangements include: (1) the use of shared collocation cages, within which multiple competing providers' equipment could be either openly accessible or locked within a secure cabinet; (2) the option to request collocation cages of any size without any minimum requirement, so that competing providers will not use any more space than is reasonably necessary for their needs; and (3) physical collocation that does not require the use of collocation cages ("cageless" collocation).[89]

(2) Discussion

39. We now adopt our tentative conclusion that incumbent LECs must provide specific collocation arrangements, consistent with the rules we outline below, at reasonable rates, terms, and conditions as are set by state commissions in conformity with the Act and

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[86] *See* Covad Comments at 25 (only with such a procedure in place "will [competitive] LECs be able to know if they are receiving discriminatory treatment"); AT&T Comments at 78; Sprint Comments at 13.

[87] *Advanced Services Order and NPRM* at paras. 136-44. *See* AT&T Comments at 79.

[88] *Advanced Services Order and NPRM* at para. 137.

[89] *See* Covad Comments at 26; AT&T Comments at 83-5.

our rules.[90] We agree with those commenters that argue requiring such alternative collocation arrangements will foster deployment of advanced services by facilitating entry into the market by competing carriers.[91] By requiring incumbent LECs to provide these alternative collocation arrangements, we seek to optimize the space available at incumbent LEC premises, thereby allowing more competitive LECs to collocate equipment and provide service. Moreover, we noted in the *Advanced Services Order and NPRM*, and the record reflects, that more cost-effective collocation solutions may encourage the deployment of advanced services to less densely populated areas by reducing the cost of collocation for competitive LECs.[92]

40. We now adopt new rules requiring incumbent LECs to make certain collocation arrangements available to requesting carriers. In adopting new rules, we reject the arguments of incumbent LEC commenters that additional national collocation rules are not necessary. For example, BellSouth argues that, rather than adopt additional rules, the Commission should "allow the parties to discuss and resolve any issues they may have on a case-by-case basis,"[93] and Ameritech argues that "collocation rates, terms and conditions have been resolved as important contractual obligations."[94] The record is replete, however, with evidence documenting the expense and provisioning delays inherent in the caged collocation process.[95] National rules governing specific collocation arrangements will help solve those

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[90] *See* Illinois C.C. Comments at 10 (alternative collocation arrangements must recognize continuing state flexibility to adopt additional standards). *See also* 47 U.S.C. § 251(c)(6) (requiring incumbent LECs to provide collocation at "rates, terms and conditions that are just, reasonable and nondiscriminatory").

[91] *See* Covad Comments at 20 (additional alternative collocation arrangements "would greatly encourage the deployment of advanced services by competitive carriers like Covad in residential and rural areas"); KMC Comments at 13 (alternative collocation arrangements "increas[e] predictability and certainty" and "facilitat[e] entry by competitors operating in several states"); NTIA Jan. 11, 1999 *Ex Parte* at 21 ("Creating multiple collocation alternatives will promote a more optimal allocation of central office space and will increase the likelihood that collocators can find suitable arrangements.").

[92] *Advanced Services Order and NPRM* at para. 138. *See* Covad Comments at 26 (large minimum space requirements and segregated collocation rooms increase costs and "ultimately presents a substantial barrier to entry in smaller towns and residential areas").

[93] BellSouth Comments at 47.

[94] Ameritech Comments at 34.

[95] *See* Covad Comments at 5 ("incumbent LECs "artificially raise the cost of obtaining space for xDSL equipment in a central office to over $100,000 . . . [and] continue to create artificial space scarcities"); MCI Worldcom Comments at 65 ("Alternative, more cost-effective methods of collocation would also spur competition, particularly in residential and rural areas"); AT&T Comments at 79-80; e.spire Comments at 25.

problems.[96] We require incumbent LECs to make each of the arrangements outlined below available to competitors as soon as possible, without waiting until a competing carrier requests a particular arrangement, so that competitors will have a variety of collocation options from which to choose. We note, however, that incumbent LECs and their competitors can, in the course of voluntary negotiations, agree to additional or different collocation terms and conditions beyond those we require in this order.

41. First, we require incumbent LECs to make shared collocation cages available to new entrants. A shared collocation cage is a caged collocation space shared by two or more competitive LECs pursuant to terms and conditions agreed to by the competitive LECs. In making shared cage arrangements available, incumbent LECs may not increase the cost of site preparation or nonrecurring charges above the cost for provisioning such a cage of similar dimensions and material to a single collocating party. In addition, the incumbent must prorate the charge for site conditioning and preparation undertaken by the incumbent to construct the shared collocation cage or condition the space for collocation use, regardless of how many carriers actually collocate in that cage, by determining the total charge for site preparation and allocating that charge to a collocating carrier based on the percentage of the total space utilized by that carrier.[97] In other words, a carrier should be charged only for those costs directly attributable to that carrier.[98] The incumbent may not place unreasonable restrictions on a new entrant's use of a collocation cage, such as limiting the new entrant's ability to contract with other competitive carriers to share the new entrant's collocation cage in a sublease-type arrangement. In addition, if two or more competitive LECs who have interconnection agreements with an incumbent LEC utilize a shared collocation arrangement, the incumbent LEC must permit each competitive LEC to order UNEs to and provision service from that shared collocation space, regardless of which competitive LEC was the original collocator.[99]

42. Second, we require incumbent LECs to make cageless collocation arrangements available to requesting carriers. In general, we agree with commenters that the use of a caged collocation space results in the inefficient use of the limited space in a LEC premises, and we consider efficient use of collocation space to be crucial to the continued development

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[96] *See* AT&T Comments at 79-80 (requiring cages reduces the efficient use of central office space and delays new entrants' ability to enter a central office); Covad Comments at 18 (with alternative arrangements, "[d]elays and costs caused by cage construction, partitioning, floor conditioning or collocation room construction would be eliminated").

[97] *See* NorthPoint Comments at 8; MCI Worldcom Comments at 65; AT&T Comments at 83-84. *See also infra* Section IV.2.f. discussing allocation of space preparation costs.

[98] *See, e.g.*, Network Access Solutions Comments at 19.

[99] *See* Letter from Michael E. Olsen, Deputy General Counsel, Government & Industry Affairs, Northpoint, to Lawrence E. Strickling, Chief, Common Carrier Bureau, Federal Communications Commission, CC Docket No. 98-147 (dated Mar. 8, 1999).

of the competitive telecommunications market.[100] While we do not prevent incumbent LECs from offering caged collocation arrangements, we require incumbent LECs to make cageless collocation available so as to offer competitors a choice of arrangements.[101] Subject only to technical feasibility and the permissible security parameters outlined below, incumbent LECs must allow competitors to collocate in any unused space in the incumbent LEC's premises, without requiring the construction of a room, cage, or similar structure, and without requiring the creation of a separate entrance to the competitor's collocation space.[102] We further agree with commenters that incumbent LECs may require competitors to use a central entrance to the incumbent's building, but may not require construction of a new entrance for competitors' use, and once inside the building incumbent LECs must permit competitors to have direct access to their equipment.[103] Incumbent LECs may not require competitors to use an intermediate interconnection arrangement in lieu of direct connection to the incumbent's network if technically feasible, because such intermediate points of interconnection simply increase collocation costs without a concomitant benefit to incumbents.[104] In addition, an incumbent LEC must give competitors the option of collocating equipment in any unused space within the incumbent's premises, to the extent technically feasible, and may not require competitors to collocate in a room or isolated space separate from the incumbent's own equipment. The incumbent LEC may take reasonable steps to protect its own equipment, such as enclosing the equipment in its own cage, and other reasonable security measures as discussed below. The incumbent LEC may not, however, require competitors to use separate rooms or floors, which only serves to increase the cost of collocation and decrease the amount of available collocation space. The incumbent LEC may not utilize unreasonable segregation requirements to impose unnecessary additional costs on competitors.

43. Incumbent LECs must also ensure that cageless collocation arrangements do not place unreasonable minimum space requirements on collocating carriers.[105] Thus, a

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[100] *See* Covad Comments at 27; Northpoint Comments at 8; AT&T Comments at 86; KMC Comments at 16. *See also* U S WEST Comments at 40 (U S WEST makes cageless collocation arrangements available to competitors).

[101] *See* Covad Comments at 27.

[102] We believe that reasonable security arrangements deployed under the supervision of state commissions will address the concern expressed by incumbent LECs that cageless collocation poses a risk to their equipment. *See infra* paras. 46-49. *See, e.g.*, Bell Atlantic Comments at 32-34, SBC Comments at 22-27, GTE Comments at 68.

[103] *See* AT&T Comments at 85 n.150.

[104] *See* Minn. PUC Comments at 11-12; AT&T Comments at 82; Sprint Reply at 34.

[105] *See* Covad Comments at 26 ("to serve smaller communities . . . Covad may only need to collocate one or two bays of equipment, which would take up, at most, 15 to 30 square feet of floor space"); AT&T Comments at 7-9; Northpoint Comments at 8. We note that SBC is willing to provide competitors with collocation space of less than 100 square feet. SBC Comments at 22. GTE provides collocation space in

competitive LEC must be able to purchase collocation space sufficient, for example, to house only one rack of equipment, and should not be forced to purchase collocation space that is much larger than the carrier requires. We require incumbent LECs to make collocation space available in single-bay increments, meaning that a competing carrier can purchase space in increments small enough to collocate a single rack, or bay, of equipment.[106] We conclude that this requirement serves the public interest because it would reduce the cost of collocation for competitive LECs and it will reduce the likelihood of premature space exhaustion. We rely on state commissions to ensure that the prices of these smaller collocation spaces are appropriate given the amount of space in the incumbent LEC's premises actually occupied by the new entrants.

44. Finally, we require incumbent LECs, when space is legitimately exhausted in a particular LEC premises, to permit collocation in adjacent controlled environmental vaults or similar structures to the extent technically feasible.[107] Such a requirement is, we believe, the best means suggested by commenters, both incumbents and new entrants, of addressing the issue of space exhaustion by ensuring that competitive carriers can compete with the incumbent, even when there is no space inside the LEC's premises.[108] Because zoning and other state and local regulations may affect the viability of adjacent collocation, and because the incumbent LEC may have a legitimate reason to exercise some measure of control over design or construction parameters, we rely on state commissions to address such issues. In general, however, the incumbent LEC must permit the new entrant to construct or otherwise procure such an adjacent structure, subject only to reasonable safety and maintenance requirements. The incumbent must provide power and physical collocation services and facilities, subject to the same nondiscrimination requirements as traditional collocation arrangements.

45. In the *Advanced Services Order and NPRM*, we also asked whether, if an incumbent LEC offers a particular collocation arrangement, such an arrangement should be presumed to be technically feasible at other LEC premises.[109] We recognize that different incumbent LECs make different collocation arrangements available on a region by region, state by state, and even central office by central office basis. Based on the record, we now

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minimum increments of 25 square feet. GTE Comments at 68.

[106] *See* Covad Comments at 28.

[107] *Advanced Services Order and NPRM* at para. 142 (seeking comment on any additional alternative collocation arrangements that incumbent LECs should make available to competitors).

[108] *See* GTE Reply at 48 (competitive LECs should be able to lease adjacent space from the incumbent at fair market rates); e.spire Comments at 24-25 ("Having this alternative will give [competitive] LECs more opportunity to optimize the available collocation arrangements"); NEXTLINK Comments at 16; Rhythms Comments at 30-31; MGC Comments at 24.

[109] *Advanced Services Order and NPRM* at para. 139.

conclude that the deployment by any incumbent LEC of a collocation arrangement gives rise to a rebuttable presumption in favor of a competitive LEC seeking collocation in any incumbent LEC premises that such an arrangement is technically feasible.[110] Such a presumption of technical feasibility, we find, will encourage all LECs to explore a wide variety of collocation arrangements and to make such arrangements available in a reasonable and timely fashion. We believe this "best practices" approach will promote competition. Thus, for example, a competitive LEC seeking collocation from an incumbent LEC in New York may, pursuant to this rule, request a collocation arrangement that is made available to competitors by a different incumbent LEC in Texas, and the burden rests with the New York incumbent LEC to prove that the Texas arrangement is not technically feasible. The incumbent LEC refusing to provide such a collocation arrangement, or an equally cost-effective arrangement, may only do so if it rebuts the presumption before the state commission that the particular premises in question cannot support the arrangement because of either technical reasons or lack of space.

e. Security

46. In the *Advanced Services Order and NPRM*, we sought comment on the security and access issues that may arise from a requirement that incumbent LECs provide alternative collocation arrangements, including cageless collocation.[111] We noted that, in the *Local Competition First Report and Order*, the Commission concluded that incumbent LECs should be permitted reasonable security arrangements to protect their equipment and ensure network security and reliability.[112] We recognized that adequate security for both incumbent LECs and competitive LECs is important to encourage deployment of advanced services.[113]

47. We conclude, based on the record, that incumbent LECs may impose security arrangements that are as stringent as the security arrangements that incumbent LECs maintain at their own premises either for their own employees or for authorized contractors.[114] To the extent existing security arrangements are more stringent for one group than for the other, the incumbent may impose the more stringent requirements. Except as provided below, we conclude that incumbent LECs may not impose more stringent security requirements than

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[110] *See* Covad Comments at 10 ("what is technically feasible in one part of the country is technically feasible in all parts of the country"); Northpoint Comments at 8; Intermedia Comments at 37-38; Allegiance Comments at 2-3; MCI Worldcom Comments at 68-69.

[111] *Advanced Services Order and NPRM* at para. 140.

[112] *Advanced Services Order and NPRM* at para. 140. *See Local Competition First Report and Order*, 11 FCC Rcd at 15803, para. 598.

[113] *Id.* *See* MCI Worldcom Comments at 66 ("Sufficient security measures are important to all providers").

[114] *See* Covad Comments at 18.

these.[115] Stated differently, the incumbent LEC may not impose discriminatory security requirements that result in increased collocation costs without the concomitant benefit of providing necessary protection of the incumbent LEC's equipment.

48. We agree with commenting incumbent LECs that protection of their equipment is crucial to the incumbents' own ability to offer service to their customers.[116] Therefore, incumbent LECs may establish certain reasonable security measures that will assist in protecting their networks and equipment from harm. The incumbent LEC may not, however, unreasonably restrict the access of a new entrant to the new entrant's equipment. We permit incumbent LECs to install, for example, security cameras or other monitoring systems, or to require competitive LEC personnel to use badges with computerized tracking systems. Incumbent LECs may not use any information they collect in the course of implementing or operating security arrangements for any marketing or other purpose in aid of competing with other carriers. We expect that state commissions will permit incumbent LECs to recover the costs of implementing these security measures from collocating carriers in a reasonable manner.[117] We further permit incumbent LECs to require competitors' employees to undergo the same level of security training, or its equivalent, that the incumbent's own employees, or third party contractors providing similar functions, must undergo. The incumbent LEC may not, however, require competitive LEC employees to receive such training from the incumbent LEC itself, but must provide information to the competitive LEC on the specific type of training required so the competitive LEC's employees can complete such training by, for example, conducting their own security training.

49. Moreover, in order to provide customers with a competitive level of service, we agree with commenters that competitive LECs must have access to their collocated equipment 24 hours a day, seven days a week.[118] If competitors do not have such access, they will be unable to service and maintain equipment or respond to customer outages in a timely manner. We do not agree, however, with Ameritech and SBC that 24 hour security escorts are necessary.[119] We agree with commenters that alternative security measures, like those outlined above, adequately protect incumbent LEC networks without the added cost and

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[115] *See id.* at 29-30.

[116] *See* Ameritech Comments at 42; GTE Reply at 57-58.

[117] *See* e.spire Comments at 30; MCI Worldcom Comments at 67; AT&T Comments at 86-87; Comptel Comments at 41-42; Intermedia Comments at 42.

[118] *See* MCI Worldcom Comments at 67; AT&T Comments at 87; e.spire Comments at 30; Covad Comments at 31-32.

[119] Ameritech Comments at 42 (security escorts are necessary to avoid "even inadvertent damage" to incumbent LEC equipment); SBC Comments at 16.

burden of security escorts.[120] We therefore conclude that incumbent LECs must allow collocating parties to access their equipment 24 hours a day, seven days a week, without requiring either a security escort of any kind or delaying a competitor's employees' entry into the incumbent LEC's premises by requiring, for example, an incumbent LEC employee to be present. We also require incumbent LECs to provide competitors reasonable access to basic facilities, such as restroom facilities and parking, while at the incumbent LEC's premises.

f. Space Preparation Cost Allocation

50. In the *Advanced Services Order and NPRM*, we sought comment on ALTS' proposal that we establish rules for the allocation of up-front space preparation charges.[121] One approach we noted, which had been adopted by Bell Atlantic in its pre-filing statement in the New York Commission's section 271 docket, was that the competing provider would be responsible only for its share of the cost of conditioning the collocation space, whether or not other competing providers were immediately occupying the rest of the space.[122] In addition, Bell Atlantic committed to allowing smaller competing providers to pay on an installment basis.[123] We sought comment on whether we should adopt Bell Atlantic's approach, or any other approach, as a national standard in order to speed the deployment of advanced telecommunications capability to all Americans.[124]

51. We conclude, based on the record, that incumbent LECs must allocate space preparation, security measures, and other collocation charges on a pro-rated basis so the first collocator in a particular incumbent premises will not be responsible for the entire cost of site preparation.[125] For example, if an incumbent LEC implements cageless collocation arrangements in a particular central office that requires air conditioning and power upgrades, the incumbent may not require the first collocating party to pay the entire cost of site

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[120] *See* e.spire Comments at 30; MCI Worldcom Comments at 67; AT&T Comments at 86-87; Comptel Comments at 41-42; Intermedia Comments at 42.

[121] *Advanced Services Order and NPRM* at para. 143.

[122] *Id.* at para. 143. *See Petition of New York Telephone Company for Approval of its Statement of Generally Available Terms and Conditions pursuant to Section 252 of the Telecommunications Act of 1996 and Draft Filing of Petition for InterLATA Entry Pursuant to Section 271 of the Telecommunications Act of 1996*, New York Commission Case 97-C-0271, Pre-Filing Statement of Bell Atlantic - New York, at 21-23 (N.Y.P.S.C. filed April 6, 1998).

[123] *Advanced Services Order and NPRM* at para. 143.

[124] *Id.*

[125] *See* Intermedia Comments at 43-44 ("such a rule will eliminate a major entry barrier . . ."); Northpoint Comments at 11 (incumbent LEC costing method "has led to a reluctance to act first that has diminished consumers' ability to choose among broadband services"); ICG Comments at 22; Covad Comments at 28-29; e.spire Comments at 31-32; Sprint Comments at 16.

preparation. In order to ensure that the first entrant into an incumbent's premises does not bear the entire cost of site preparation, the incumbent must develop a system of partitioning the cost by comparing, for example, the amount of conditioned space actually occupied by the new entrant with the overall space conditioning expenses. We expect state commissions will determine the proper pricing methodology to ensure that incumbent LECs properly allocate site preparation costs among new entrants. We also conclude that these standards will serve as minimum requirements, and that states should continue to have flexibility to adopt additional collocation requirements, consistent with the Act.

g. Provisioning Intervals

52. In the *Advanced Services Order and NPRM*, we sought comment on how to address the entry barrier posed by delays between the ordering and provisioning of collocation space. Specifically, we sought comment on ALTS' proposal that we should establish presumptive reasonable deployment intervals for new collocation arrangements and expansion of existing arrangements.[126] Currently, some incumbent LECs require a new entrant to obtain state competitive LEC certification before it can begin to negotiate an interconnection agreement. In addition, competitive LECs asserted that some incumbent LECs will not allow a requesting carrier to order collocation space until an interconnection agreement becomes final.[127]

53. We conclude that an incumbent LEC may not impose unreasonable restrictions on the time period within which it will consider applications for collocation space. Specifically, we conclude that an incumbent LEC may not refuse to consider an application for collocation space submitted by a competitor while that competitor's state certification is pending, or before the competitor and incumbent LEC have entered into a final interconnection agreement.[128] We agree with commenters who contend that there is no legitimate reason for an incumbent LEC to refuse to begin processing a collocation application, especially given that competitors pay an application fee to the incumbent to cover the costs associated with consideration of the application.[129]

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[126] *Advanced Services Order and NPRM* at para. 144.

[127] *Id.* at para. 143.

[128] *See* NTIA Jan. 11, 1999 *Ex Parte* at 22 ("[competitive LECs] should have the option of accelerating the start of the provisioning process by ordering space prior to a finalized interconnection agreement . . .").

[129] *See* Northpoint Comments at 12 (U S WEST, for example, refused to permit Northpoint to order collocation space until it had signed an interconnection agreement, the agreement had been approved by the state commission, and Northpoint had been certified as a competitive LEC by the state); Level 3 Comments at 10; Sprint Comments at 17. *See also* Ameritech Comments at 45 (Ameritech permits carriers to submit collocation applications before state certification or interconnection agreements are completed).

54. We do not adopt specific provisioning intervals at this time. We have adopted several new collocation rules in this Order, and we do not yet have sufficient experience with the implementation of these new collocation arrangements to suggest time frames for provisioning. While we do not at this time adopt specific intervals, we retain authority to adopt specific time frames in the future as we deem necessary. We emphasize the importance of timely provisioning, and we are confident that state commissions recognize the competitive harm that new entrants suffer when collocation arrangements are unnecessarily delayed. The record in this proceeding reflects the significant competitive harm suffered by new entrants whose collocation space is not ready for as long as six to eight months after their initial collocation request is submitted to the incumbent LEC.[130] Several state commissions have taken significant steps to lessen the time periods within which incumbent LECs provision collocation space.[131] The Texas PUC has required Southwestern Bell Telephone Company (SWBT) to provide competitive LECs with information on space availability in a SWBT premises within ten days of receipt of a collocation request.[132] Because of the importance of ensuring timely provisioning of collocation space, we encourage state commissions to ensure that incumbent LECs are given specific time intervals within which they must respond to collocation requests.

55. The practices of several carriers suggest that provisioning intervals can be short. Both GTE and Ameritech state that they respond to physical collocation requests within ten days by advising the requesting carrier whether space is available or not.[133] We view ten days as a reasonable time period within which to inform a new entrant whether its collocation application is accepted or denied. Even with a timely response to their applications, however, new entrants cannot compete effectively unless they have timely access to provisioned collocation space. We urge the states to ensure that collocation space is available in a timely and pro-competitive manner that gives new entrants a full and fair opportunity to compete.

h. Space Exhaustion

56. In the *Advanced Services Order and NPRM*, we noted that one of the major barriers facing new entrants that seek to provide advanced services on a facilities basis is the lack of collocation space in many incumbent LEC premises.[134] Pursuant to the Act,

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[130] *See, e.g.*, Covad Comments at 8 (up to 180 business days from date of application to provisioning of collocation space in certain Bell Atlantic states).

[131] *See, e.g.*, Texas PUC Comments at 8; NY PUC Comments at 9-10.

[132] *See* Intermedia Comments at 23.

[133] GTE Comments at 74; Ameritech Comments at 45.

[134] *Advanced Services Order and NPRM* at para. 145.

incumbent LECs must provide physical collocation unless they demonstrate to the state commission's satisfaction that "physical collocation is not practical for technical reasons or because of space limitations."[135] Because incumbent LECs have the incentive and capability to impede competition by reducing the amount of space available for collocation by competitors, the Commission, in the *Local Competition First Report and Order*, required incumbent LECs that deny requests for physical collocation on the basis of space limitations to provide the state commission with detailed floor plans or diagrams of their premises.[136] The Commission concluded that such submissions would aid the state commission in evaluating whether the denial of physical collocation was justified.[137]

57. We now adopt our tentative conclusion that an incumbent LEC that denies a request for physical collocation due to space limitations should, in addition to providing the state commission with detailed floor plans, allow any competing provider that is denied physical collocation at the incumbent LEC's premises to tour the premises. This proposal received wide support in the record.[138] Specifically, we require the incumbent LEC to permit representatives of a requesting telecommunications carrier that has been denied collocation due to space constraints to tour the entire premises in question, not just the room in which space was denied, without charge, within ten days of the denial of space.[139] As we noted in the *Advanced Services NPRM*, allowing competing providers to walk through a LEC's premises will enable those providers to identify space that they believe could be used for physical collocation.[140] If, after the tour of the premises, the incumbent LEC and competing provider disagree about whether space limitations at that premise make collocation impractical, both carriers could present their arguments to the state commission. We disagree with the comments of several incumbent LECs that tours are unnecessary and could

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[135] 47 U.S.C. § 251(c)(6).

[136] *Local Competition First Report and Order*, 11 FCC Rcd at 15805, para. 602.

[137] *Id.*

[138] *Advanced Services Order and NPRM* at para. 146. *See* Covad Comments at 33-34; MCI Worldcom Comments at 69; KMC Comments at 18; Illinois C.C. Comments at 12; Comptel Comments at 44; AT&T Comments at 90; ICG Comments at 25-27; Intermedia Comments at 43; Sprint Comments at 18; Texas PUC Comments at 12; Northpoint Comments at 15; Allegiance Comments at 6.

[139] *See* Covad Comments at 19; e.spire Comments at 29; NTIA Jan. 11, 1999 *Ex Parte* at 22.

[140] *Advanced Services Order and NPRM* at para. 146. *See* GTE Comments at 49 (supporting third party verification of space availability claims); Covad Comments at 34 ("not knowing the space status of a particular office can delay the [competitive] LEC one month while such a survey of available space is done"); NEXTLINK Comments at 15 (tour of U S WEST premises after denial of collocation resulted in space being provisioned); e.spire Comments at 29.

potentially harm LEC central offices.[141] Incumbent LECs are permitted to assign their own personnel to such tours, thus offering sufficient protection against harm to the network and proprietary information.

58. We also adopt our tentative conclusion that an incumbent LEC must submit to a requesting carrier within ten days of the submission of the request a report indicating the incumbent LEC's available collocation space in a particular LEC premises.[142] This report must specify the amount of collocation space available at each requested premises, the number of collocators, and any modifications in the use of the space since the last report. The report must also include measures that the incumbent LEC is taking to make additional space available for collocation. In addition to this reporting requirement, we adopt the proposal of Sprint that incumbent LECs must maintain a publicly available document, posted for viewing on the Internet, indicating all premises that are full, and must update such a document within ten days of the date at which a premises runs out of physical collocation space.[143] Such requirements will allow competitors to avoid expending significant resources in applying for collocation space in an incumbent LEC's premises where no such space exists.[144] We expect that state commissions will permit incumbent LECs to recover the costs of implementing these reporting measures from collocating carriers in a reasonable manner.[145]

59. We disagree with those commenters that argue that preparing such reports would be of no use to requesting carriers because the information contained in them would change frequently.[146] For network planning purposes, new entrants need to know what incumbent LEC offices are available for collocation. We disagree with GTE that new entrants should first have to "submit a written request [for collocation space] along with an

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[141] *See* Bell Atlantic Comments at 43; BellSouth Comments at 47; Ameritech Comments at 46-47. SBC contends that permitting competitive LEC representatives to tour central offices could raise "potential intellectual property/proprietary concerns." SBC Comments at 29. SBC does not provide any explanation for how these concerns would be raised by the mere presence of a competitive LEC employee in SBC's central office, nor does SBC explain how these concerns would outweigh the importance of providing tours of incumbent LEC facilities.

[142] *Advanced Services Order and NPRM* at para. 147. *See* NTIA Jan. 11, 1999 *Ex Parte* at 17-18 ("the Commission should require [incumbent] LECs to establish and maintain lists from which competitors can learn exactly how much collocation space is available in each central office").

[143] *See* Sprint Comments at 18. We note that Bell Atlantic already makes information available on an Internet website concerning space availability in its offices in New York. Bell Atlantic Comments at 43.

[144] *See* AT&T Comments at 88; Qwest Comments at 57; ICG Comments at 25.

[145] *See, e.g.*, e.spire Comments at 30; MCI Worldcom Comments at 67; AT&T Comments at 86-87; Comptel Comments at 41-42; Intermedia Comments at 42.

[146] *See, e.g.*, Ameritech Comments at 47.

application fee" before discovering if space is available in a LEC office.[147] Each new entrant cannot be required to apply for collocation space in every central office in order to find out if there is space available in that office, when such information is readily available to the incumbent LEC that occupies that office.

60. Finally, we conclude that in order to increase the amount of space available for collocation, incumbent LECs must remove obsolete unused equipment from their premises upon reasonable request by a competitor or upon the order of a state commission.[148] There is no legitimate reason for an incumbent LEC to utilize space for obsolete or retired equipment that the incumbent LEC is no longer using when such space could be used by competitors for collocation. The record reflects that some incumbent LECs already remove obsolete equipment to increase collocation space.[149] We believe it would be anticompetitive for an incumbent to maintain such equipment in its premises and contend that no collocation space is available. We rely on state commissions to settle disputes between carriers as to which incumbent equipment is truly obsolete and unused and can be removed from the LEC's premises. We also note that carriers may utilize the complaint provisions of section 208 of the Act in the case of collocation disputes that fall within the Commission's jurisdiction.

B. Spectrum Compatibility

61. Background. Spectrum compatibility refers generally to the ability of various loop technologies to reside and operate in close proximity[150] while not significantly degrading each other's performance. Our discussion of spectrum compatibility includes spectral compatibility standards issues, such as setting the signal power densities so as to minimize interference, and spectrum management issues, such as establishing binder group administration and deployment practices.[151] The development of spectral compatibility standards should help to minimize crosstalk, the noise caused by extraneous signals

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[147] GTE Comments at 74.

[148] *Advanced Services Order and NPRM* at para. 142. *See* Sprint Comments at 15; Qwest Comments at 57-58; AT&T Comments at 88; NEXTLINK Comments at 15; Northpoint Comments at 8..

[149] *See* U S WEST Comments at 41 ("U S WEST often removes 'obsolete' equipment to increase available space in central offices"); Ameritech Comments at 44 (Ameritech already removes equipment that is not used and useful from central offices).

[150] Proximity refers to loop technologies residing in the same or an adjacent "binder group." Twisted copper pairs, used to deliver xDSL-based services and other services, including plain old telephone service, are typically housed within binder groups (cable sheaths housing multiple loops).

[151] Although the terms "spectrum compatibility" and "spectrum management" are often used interchangeably, we intend the rights in the "spectrum compatibility" section to refer to a service provider's general right to deploy a particular technology and the rights in the "spectrum management" section to refer to the provider's right to deploy a technology in a particular situation.

combining with the intended signal. This noise can result in the degradation of the intended signal. Compatibility becomes a significant concern with the introduction of new high-speed services in a multiple provider environment. For example, if an incumbent LEC and a competitive LEC offer DSL services that use different line encoding technologies, and if their respective customers' loops are located adjacent to each other within a binder group, the two technologies may unintentionally interfere with one another and interrupt the signals travelling over each loop. One method of ensuring spectral compatibility is through the use of power spectral density (PSD) masks. PSD masks are represented as graphical templates that define the limits on signal power densities across a range of frequencies so as to minimize interference. The goal of PSD mask standards is to permit divergent technologies to coexist in close proximity within the same binder groups. Standards bodies, such as T1E1.4,[152] define these masks as technology develops. The development of spectrum management rules and practices should help enable multiple technologies to coexist within binder groups.

62. In the *Advanced Services Order and NPRM*, we sought comment on how to address the host of loop spectrum compatibility issues.[153] In particular, we asked commenters to consider how we should address interference concerns that may result from provision of advanced services using different signal formats on copper pairs in the same bundle.[154] We asked parties to suggest ways to determine when a particular service, technology, or piece of equipment causes network interference such that the use of the particular service, technology, or piece of equipment should be prohibited.[155] We also asked commenters to suggest ways to distinguish between legitimate claims that particular services, technologies, or equipment create spectrum interference and claims raised simply to impede competition. We sought comment on whether we should adopt any industry standards as the basis for national spectrum compatibility requirements.[156] We also sought comment on how any requirements should evolve over time so as to encourage and not stifle innovation. In addition, we sought

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[152] The T1E1.4 working group of the American National Standards Institute (ANSI) is developing standards for the various varieties of xDSL. *See e.g.*, Network and Customer Installation Interfaces - Asymmetric Digital Subscriber Line (ADSL) Metallic Interface (ANSI T1.413-1995) (ANSI T1.413 standard presents the electrical characteristics of the ADSL signals appearing at the network interface.) The physical interface between the network and the customer installation is also described. The transport medium for the signals is a single twisted-wire pair that supports both Message Telecommunications Service (also referred to as POTS) and full-duplex (simultaneous two-way) and simplex (from the network to the customer installation) digital services. This interface standard provides the minimal set of requirements for satisfactory transmission between the network and the customer installation. Equipment may be implemented with additional functions and procedures. For more information on T1E1.4, *see* http://www.t1.org/t1e1/_e14home.htm.

[153] *Advanced Services Order and NPRM* at paras. 159-62.

[154] *Id.* at para. 159.

[155] *Id.* at para. 162.

[156] *Id.*

comment on other approaches to spectrum management that would foster pro-competitive use of the loop plant by incumbent LECs and new entrants, while providing necessary network protection.[157]

63. Discussion. We acknowledge that clear spectral compatibility standards and spectrum management rules and practices are necessary both to foster competitive deployment of innovative technologies and to ensure the quality and reliability of the public telephone network.[158] We find, however, that incumbent LECs should not unilaterally determine what technologies LECs, both competitive LECs and incumbent LECs, may deploy. Nor should incumbent LECs have unfettered control over spectrum management standards and practices. We are persuaded by the record that allowing incumbent LECs such authority may well stifle deployment of innovative competitive LEC technology.[159] Various commenters argue that some incumbents are frustrating the deployment of advanced services under the guise of spectrum compatibility concerns.[160] The better approach, we believe, is to establish competitively neutral spectral compatibility standards and spectrum management rules and practices so that all carriers know, without being subject to unilateral incumbent LEC determinations, what technologies are deployable and can design their networks and business strategies accordingly.

64. We find that we do not have a sufficient record with which we can adequately address all of the long-term spectrum compatibility issues.[161] Thus, we adopt below a Further NPRM through which we hope to resolve, in a timely manner, the long-term spectrum compatibility issues.[162] In the Further NPRM, we seek comment on additional measures we can take to encourage deployment of innovative technology while simultaneously ensuring the integrity of the network. In this Order, we adopt certain rules on spectrum compatibility and management which we believe will enable reasonable and safe deployment of advanced services prior to development of industry standards and resolution of all the issues raised in the Further NPRM.

1. Existing Power Spectral Density Masks

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[157] *Id.* at para. 163.

[158] *See, e.g.*, NTIA Jan. 11, 1999 *Ex Parte* at 25-26.

[159] *See* Paradyne Comments at 3.

[160] *See, e.g.*, AT&T Comments at 59; Covad Comments at 44-48; DATA Comments at 10; Northpoint Comments at 18-19.

[161] For example, the record is insufficient for us to determine how to develop future power spectral density masks for new technologies on a fair and open basis.

[162] *See infra* Section V.A.

65. Commenters generally agree that the process of establishing power spectral density masks best occurs within the industry standards setting bodies.[163] Such standards bodies possess the combined knowledge and expertise of a broad sector of the industry.

66. We conclude, however, that we should establish certain rules on spectrum compatibility that will immediately facilitate the deployment of advanced services, until long-term standards and practices can be established.[164] Although we believe that the development of power spectral density masks is best left to standards bodies such as the T1E1.4, we also believe the Commission can take certain immediate steps to encourage the deployment of advanced services.[165] Rather than setting forth in this Order specific standards for the new technologies, we establish certain rules to foster deployment of advanced services while maintaining network integrity, until the standards bodies adopt comprehensive standards for the new technologies. We find that any equipment deployed consistent with the rules adopted here can be connected to the public switched telephone network with reasonable confidence that this technology will not significantly degrade the performance of other advanced services, and with reasonable confidence that this technology will not impair traditional voice band services.[166]

67. We conclude that any loop technology that complies with existing industry standards is presumed acceptable for deployment. Specifically, we conclude that technology that complies with any of the following standards is presumed acceptable for deployment: T1.601, T1.413, and TR28.[167] Furthermore, any technology which has been successfully

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[163] See Qwest Comments 62; AT&T Comments at 68; GTE Reply Comments at 68; NTIA Jan. 11, 1999 *Ex Parte* at 25.

[164] *See, e.g.*, ALTS Comments at 6062; AT&T Comments at 52-53; Covad Comments at 44.

[165] *See id.*

[166] For purposes of this discussion, we define "significantly degrade" as an action that noticeably impairs a service from a user's perspective. We acknowledge that this definition is subject to debate. We currently leave it to the states to determine when a technology significantly degrades the performance of other services. We seek comment in the accompanying Further NPRM as to how to define "significantly degrade" more precisely and how to resolve disputes arising out of claims that a technology is significantly degrading the performance of other services. *See infra* para. 88. While we recognize that some minimal interference may develop as new services are introduced, we believe that it is in the public's best interest to encourage the timely deployment of advanced services. We understand, however, that these advanced services will operate well above the voice grade spectrum, and therefore should not interfere with existing analog voice and analog modem services.

[167] T1.601 defines the technical standards for the provision of BRI ISDN service. T1.413 defines the technical standards for the provision ADSL service. TR28 defines the technical standards for the provision HDSL service. We recognize that TR.28 is not a Committee T1 approved standard. TR.28's universal deployment, however, results in its status as a *de facto* standard. *See* Letter from Jeffrey Blumenfeld, Glenn Manishin, and Frank Paganelli, Blumenfeld & Cohen, Counsel for DSL Access Telecommunications Alliance, to Lawrence Strickling, Chief, Common Carrier Bureau, Federal Communications Commission, CC Docket No.

deployed by any carrier without significantly degrading the performance of other services or has been approved by this Commission, any state commission, or an industry standards body is presumed acceptable for deployment.[168]

68. We conclude that a LEC may not deny a carrier's request to deploy technology that is presumed acceptable for deployment, unless the LEC demonstrates to the state commission that deployment of the particular technology within the LEC network will significantly degrade the performance of other advanced services or traditional voice band services. We conclude further that industry standards are not upper limits on what technology is deployable; incumbent LECs and competitive LECs are free to mutually agree to deploy new technologies that may exceed these standards. We encourage cooperation between incumbents and competitors to establish agreements on the deployment of non-standard xDSL-based and other advanced services technology. We expect that as standards are ratified for new technologies, carriers will recognize these as deployable technologies and will not deny competitors the ability to deploy these technologies.[169] In the event that a LEC subsequently demonstrates to this Commission or the relevant state commission that a deployed technology is significantly degrading the performance of other advanced services or traditional voice band services, the carrier deploying the technology shall discontinue deployment of that technology and migrate its customers to technologies that will not significantly degrade the performance of other such services.

69. We further conclude that incumbent LECs cannot deny requesting carriers the right to deploy a new technology that does not conform to the standards cited in the preceding paragraph and has not yet been approved by a standards body (or otherwise authorized by this Commission or any state commission), if the requesting carrier can demonstrate to the state commission that this particular technology will not significantly degrade the performance of other advanced services or traditional voice band services. In this situation, there would be no presumption in favor of deployment and the burden would be on the requesting carrier to make the appropriate showing.

2. Spectrum Management

70. Commenters disagree on how to address spectrum management issues. Incumbent LECs state that they are ultimately responsible for the management of the network

98-147, at 9 (DATA Dec. 1, 1998 *Ex Parte*).

[168] For example, NorthPoint contends that it has successfully deployed SDSL technology in seven states. Letter from Ruth Milkman, The Lawler Group, Counsel for Northpoint, to Magalie Roman Salas, Secretary, Federal Communications Commission, CC Docket No. 98-147, at 11 (filed Nov. 24, 1998) (Northpoint Nov. 24, 1998 *Ex Parte*); *see also* DATA Dec. 1, 1998 *Ex Parte* at 9.

[169] *See* DATA Dec. 1, 1998 *Ex Parte* at 9.

and should make the final decision whether a technology should be deployed.[170] Non-incumbent LECs claim that the incumbent LECs are using this authority to exclude technologies that could be safely deployed.[171] In order to encourage deployment of innovative technology and allow competitors the same opportunity as incumbent LECs to deploy advanced services, while simultaneously ensuring the integrity of the network, we establish certain spectrum management rules.[172]

71. We define spectrum management to include binder/cable administration[173] as well as the broader issue of deployment practices (*e.g.*, the rules for testing and implementing xDSL-based and other advanced services). We believe that the industry must develop a simpler and more open approach to spectrum management. Currently, each incumbent LEC defines its own spectrum management specifications. These measures vary from provider to provider and from state to state, thereby requiring competitive LECs to conform to different specifications in each area.[174] We find that uniform spectrum management procedures are essential to the success of advanced services deployment. As such, we adopt the following spectrum management rules.

72. We conclude that the incumbent LEC must provide competitive LECs with nondiscriminatory access to the incumbent LEC's spectrum management procedures and policies.[175] The procedures and policies that the incumbent LEC uses in determining which services can be deployed must be equally available to competitive LECs intending to provide service in an area.[176] We believe that competitive LECs need nondiscriminatory access to

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[170] *See, e.g.*, SBC Comments at 34-35 ("[until the development of alternative systems/methods], spectrum management will remain the principle responsibility of the incumbent LEC, the only entity in place to coordinate and enforce standards among a number of different carriers.").

[171] *See, e.g.*, Qwest Comments at 61 (spectrum management is "an area ripe for [incumbent] LEC discrimination"); Paradyne Comments at 5 ("Too often, spectral compatibility concerns are raised simply as a means to thwart competition . . .").

[172] *See, e.g.*, NTIA Jan. 11, 1999 *Ex Parte* at 26.

[173] Individual copper loops are wrapped together in large bunches, referred to as a binder or cable, for efficient administration before the loops enter the central office.

[174] *See* AT&T Reply Comments at 68-69; DATA Comments at 16; DATA Dec. 1, 1998 *Ex Parte* at 9.

[175] NTIA Jan. 11, 1999 *Ex Parte* at 25-26. For example, GTE provides information on DSLAM deployment, as well as providing competitive LECs access to binder group data through a web based application. *See* http://www.gte.com/Regulatory/ret_july/fl_ret1.html.

[176] *See* Copper Mountain Comments at 25 (in a situation where an incumbent LEC claims incompatibility, the competitive LEC can take corrective measures to resolve this incompatibility -- for example, equipment might be adjusted to resolve the problem or service could be limited in rate or distance).

such information so that the competitive LEC can independently and expeditiously determine what services and technologies it can deploy within the incumbent LEC's territory.[177]

73. We conclude that incumbent LECs must disclose to requesting carriers information with respect to the rejection of the requesting carrier's provision of advanced services, together with the specific reason for the rejection. The incumbent LEC must also disclose to requesting carriers information with respect to the number of loops using advanced services technology within the binder and type of technology deployed on those loops.[178] We believe that such disclosure will allow for a more open and accessible environment, foster competition, and encourage deployment of advanced services.

74. We strongly believe that industry should discontinue deployment of well recognized disturbers,[179] such as AMI T1.[180] We further believe carriers should, to the fullest extent possible, replace AMI T1 with new and less interfering technologies. In the accompanying Further NPRM, we seek comment on methods by which to reduce or eliminate the deployment of AMI T1.[181]

75. We conclude that if a carrier claims a service is significantly degrading the performance of other advanced services or traditional voice band services, then that carrier must notify the causing carrier and allow that carrier a reasonable opportunity to correct the problem.[182] Any claims of network harm must be supported with specific and verifiable supporting information.[183]

76. We recognize that there may be a limit to the number of lines delivering advanced services that can share a binder group without interfering with other customers' services. We conclude that the incumbent LEC shall bear the burden of demonstrating to the relevant state commission when a requested advanced service will significantly degrade the

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[177] *See* AT&T Reply Comments at 69-70.

[178] *See* AT&T Comments at 53.

[179] A disturber is a service that significantly degrades another service.

[180] *See* Covad Comments at 45; *see also* http://adsl.com/today_index.html. An AMI T1, also referred to as analog T1, is a loop that transmits at T1 rate (1.544 Mbps) using alternate mark inversion (AMI) line code.

[181] *See infra* para. 87.

[182] *See, e.g.*, Sprint Comments at 36.

[183] *See* AT&T Reply Comments at 51. *See infra* para. 88, seeking comment on developing a dispute resolution process.